# Notes on *Aradidae* from the Eastern Hemisphere, XX

## (Hem. Heteroptera)

BY

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By the kind offices of Dr. W. E. China, formerly in charge of Hemiptera at the British Museum (N. H.), London, to whom I express my sincere gratitude, I have had a privilege to study some unidentified Aradidae from the collections at his charge.

A relatively small lot resulted to be very interesting by amount of new species it contained: from 14 genera and 27 species, represented in this lot, 1 genus and 14 species were new, and are described else where in this paper. Eight of new species were collected by Miss L. E. Cheesman, who collected on New Hebrides and New Guinea.

From more interesting species should be mentioned a new micropterous species of the genus *Zimmermania* Usinger, 1948, from New Hebrides, mentioned by Usinger and Matsuda in the Classification of Aradidae (1959: 106), but not described, and an also micropterous new genus and new species from Australia (N. S. W.). It should be mentioned also a new species of the genus *Aradus* F., 1803, from Morocco.

Two species of the genus *Calisius* Stål, 1858, represented in this lot, were not included in this paper, because they were treated in another.

All measurements indicated in descriptions were taken with a micromillimeter eyepiece, 25 units equal 1 mm. In ratios the first figure represents the length, and the second the width of measured portion. For convenience, the length of abdomen was taken from the tip of scutellum to the apex of hypopygium, or segment IX in the female.

## Subfam. ARADINAE.

### Gen. **Aradus** Fabricius, 1803.

### 1. **Aradus maroccanus** n. sp.

Fig. 1.

Male. *Head* slightly longer than width across the eyes (♂-26: 25, ♀-29: 28). Anterior process robust, with parallel sides, reaches slightly over the base of antennal segment II. Antenniferous tubercles acute, slightly divergent; lateral tooth minuscule. Eyes subglobose, protruding, but not pedunculate. Preocular and postocular teeth are connected by an infraocular ridge. Vertex with a deep, and relatively wide, semicircular depression. Antennae moderately stout, with segments II to IV cylindrical, rounded at the base and apically; proportions of antennal segments, I to IV, are: ♂-5: 15: 12: 9, ♀-6: 16: 13.5: 10. Rostrum reaches to fore coxae.

*Pronotum* trapezoidal, less than half as long as its maximal width (♂-17.5: 40, ♀-22.5: 50). Antero-lateral angles rounded and slightly produced forward; lateral borders strongly convergent forward, slightly convex on fore lobe, sinuate in the middle, more convex on hind lobe. Hind border deeply sinuate in the middle, produced and rounded laterally. Collar tiny, indistinctly separated from disc. Fore disc with two (1 + 1) parallel carinae, converging anteriorly and fused with collar; carinae produced backward across hind lobe and reaching to hind border, where they become thinner and obsolete. On fore disc lateral of carinae are placed two (1 + 1) semicircular, black callosities. Hind disc with four (2 + 2) thin carinae, and laterad of them two (1 + 1) short ridges; between carinae disc is finely, transversely rugose.

*Scutellum* longer than width at base (♂-32.5: 19, ♀-35: 23). Lateral borders slightly convex, reflexed; apex narrowly rounded. Disc twice (1 + 1) depressed at the base, transversely raised at 1/4 of its length, again depressed posteriorad of elevation.

*Hemelytra* complete, covering hypopygium in the male, reaching over the middle of tergum VII in the female. Exterior border of corium rounded, extended and reflexed, produced far beyond lateral border of pronotum; apical angle of corium rounded, reaching to hind border of connexivum IV.

*Abdomen* longer than maximal width across segment V (♂-79:60, ♀-95:78). Lateral borders parallel, converging anteriorly and posteriorly; connexivum reflexed in both sexes. Genital lobes contiguous at the base, and divergent apically in the male; tergum VIII deeply, angularly cut out in the female.

*Color:* brown; the tip of antennal segment II, and apical 1/4 of segment III, are pale; connexivum and tergum reddish with some brown spots; genital plates in the male reddish at the base, brown apically, and yellow on interior border.

Total length: ♂-5.68, ♀-6.88 mm.; width of pronotum: ♂-1.60, ♀-2.00 mm.; width of abdomen: ♂-2.40, ♀-3.12 mm.

*Holotype:* ♂, Morocco, Middle Atlas Mts, Timbadit, 5000 ft. — K. H. Chapman coll. IX.1935; Brit. Mus. 1935-493; Deposited in the British Museum, N. H., London.

*Allotype:* ♀, and *paratypes:* 1 ♂ & 2 ♀♀, collected with holotype; in the same Museum, and collection of the author.

*Aradus maroccanus* n. sp. by general aspect resembles *Aradus (Quilnus) discedens* Horvath, 1911, but rostrum is longer reaching to fore coxae, and ant. segment II is longer than III. In Kiritshenko's key for Palaeartic *Aradus* species (1913:60) it runs to *A. erosus* Fallen, 1807, but is quite different.

## 2. **Aradus foliaceus** Kormilev.

*Aradus foliaceus* Kormilev, 1957, Quart. Jour. Taiwan Mus.; 10: 38, figs. 1-2.

4 ♂♂ & 5 ♀♀, Tonkin, Hoabinh — R. V. de Salvaza coll. Oct. 1919; Brit. Mus. 1922-112.

## 3. **Aradus fuscicornis** Kormilev.

*Aradus fuscicornis* Kormilev, 1966, Rec. S. Australian Mus., 15: 278, figs. 3-4.

2 ♂♂ & 2 ♀♀, West Australia, Yanchep, 32 m. N. of Perth — R. E. Turner coll. 20.I. — 8.II.1936; Brit. Mus. 1936-28.

## Subfam. **ANEURINAE.**

### Gen. **Aneurus** Curtis, 1825.

### 1. **Aneurus superbus** sp. nov.

Figs. 2-3.

Female. Elongate ovate, shiny.

*Head* shorter than width across eyes (15: 17). Anterior process conical, rounded anteriorly, reaching to 4/5 of antennal segment I. Antenniferous tubercles short, obliquely truncate, do not reach to apex of jugae. Eyes large, moderately convex. Postocular borders rounded. Vertex roundly depressed just behind clypeus; posteriorad of depression transversely rugose. Antennae long and slender, almost three times as long as head (44.5: 15). Ant. segment I ovate, II tapering toward the base, III cylindrical, petiolate at base, IV elongate fusiform. Proportions, I to IV, are: 6: 9: 12: 17.5. Rostrum reaches to hind border of eyes; rostral groove wide, shallow, transversely rugose.

*Pronotum* less than half as long as its maximal width (20: 44). Collar thin, sinuate anteriorly. Antero-lateral angles produced beyond collar, angularly rounded; lateral borders parallel at humeri, strongly convergent and twice sinuate anteriorly; in dorsal view in the first sinus is visible inflated portion of propleuron. Fore disc with a thin median sulcus, which does not reach to collar anteriorly. Hind disc with two fine, transverse sulci in the middle.

*Scutellum* subtriangular, with wide, flat, rounded lateral borders, and subangularly rounded apex. Disc separated from borders by fine sulci, slightly triangularly raised, and transversely striate on apical half of elevation.

*Hemelytra* reach over fore border of tergum VII; corium indistinctly separated from membrane, does not reach to middle of scutellum. Exterior border of hemelytron angularly cut out at the level of connexivum II; membrane finely wrinkled.

*Abdomen* ovate, longer than maximal width across segment IV, or V (96: 63). Connexivum slightly raised laterally, with smooth lateral borders. PE-angles not protruding. Spiracles II and VII lateral and visible from above; III to IV ventral, placed close to margin; VIII terminal. Paratergites very short, rounded posteriorly, produced as far as segment IX, the latter slightly sinuate in the middle.

Lateral border of propleuron longitudinally depressed from fore coxae backward.

*Color:* head, pronotum, scutellum, and membrane, dark brown to piceous, shiny; apical half of ant. segm. IV, connexivum, and venter, light brown; rostrum, tips of tibiae, and tarsi, yellow-brown.

Total length 6.0 mm.; width of pronotum 1.76 mm.; width of abdomen 2.52 mm.

*Holotype:* ♀, New Guinea, Papua, Kokoda, 1200 ft. — L. E. Cheesman coll. IX.1933; Brit. Mus. 1934-321; deposited in the British Museum (N. H.), London.

*Aneurus superbus* n. sp. is the largest species of *Aneurus* in the Oriental and Australian Regions, it is related to *Aneurus plicatus* Bergroth, 1914, to which it runs in Bergroth's key (1914: 104), but may be separated by: larger size, by ant. segment I produced beyond apex of anterior process, by ant. segm. II shorter than III, and by ant. segment III cylindrical.

### 2. **Aneurus micronesicus** Esaki and Matsuda.

*Aneurus micronesicus* Esaki and Matsuda, 1951, Mushi; 22: 83.

3 ♂♂ & 1 ♀, New Guinea, Papua, Mt. Tafa, 8500 ft. — L. E. Cheesman coll. II-III.1934; Brit. Mus. 1934-321; 1 ♀, Papua, Mondo, 5000 ft. — L. E. Cheesman coll. II.1934; Brit. Mus. 1934-321.

### 3. **Aneurus cheesmani** sp. nov.

Figs. 4-5.

Male. Elongate ovate, shiny.

*Head* as long (♂), or slightly shorter (♀) than width across eyes (♂-12: 12, ♀-11: 12.5). Anterior process conical, does not reach to the tip of antennal segment I; antenniferous tubercles very short, blunt exteriorly. Eyes moderately large, and moderately convex. Postocular borders rounded. Mesad of eyes are placed two (1 + 1) large, ovate callosities. Vertex finely, transversely rugose. Antennae slender, more than twice as long as head (♂-24.5: 12, ♀-24.5: 11);

ant. segment I ovate, broadly petiolate at base; II strongly tapering toward the base; III subcylindrical, slightly tapering toward the base, and petiolate; IV elongate fusiform. Proportions, I to IV, are: ♂-4: 4.5: 5.5: 10.5, ♀-4: 4.5: 5.5: 10.5. Rostrum reaches to hind border of eyes; rostral groove wide, shallow, transversely rugose.

*Pronotum* less than half as long as its maximal width (♂-12: 26, ♀-11.5: 27). Collar distinct, sinuate anteriorly. Antero-lateral angles angularly rounded, produced forward beyond collar; lateral borders parallel at humeri, strongly convergent and twice sinuate anteriorly; in dorsal aspect in the fore sinus is seen inflated portion of propleuron. Fore disc with a fine median sulcus, very finely punctured laterally; hind disc with two transverse furrows along interlobal depression.

*Scutellum* subtriangular, shorter than width at the base (♂-10: 15, ♀-9: 17). Lateral borders flat, convex, rounded; apex angularly rounded; disc separated from lateral borders by fine sulci, slightly raised and very finely, concentrically striate.

*Hemelytra* reach over fore border of tergum VII (♂), or only touch the latter (♀). Corium reaches to the middle of scutellum; lateral borders straight at the level of connexivum II; membrane finely wrinkled.

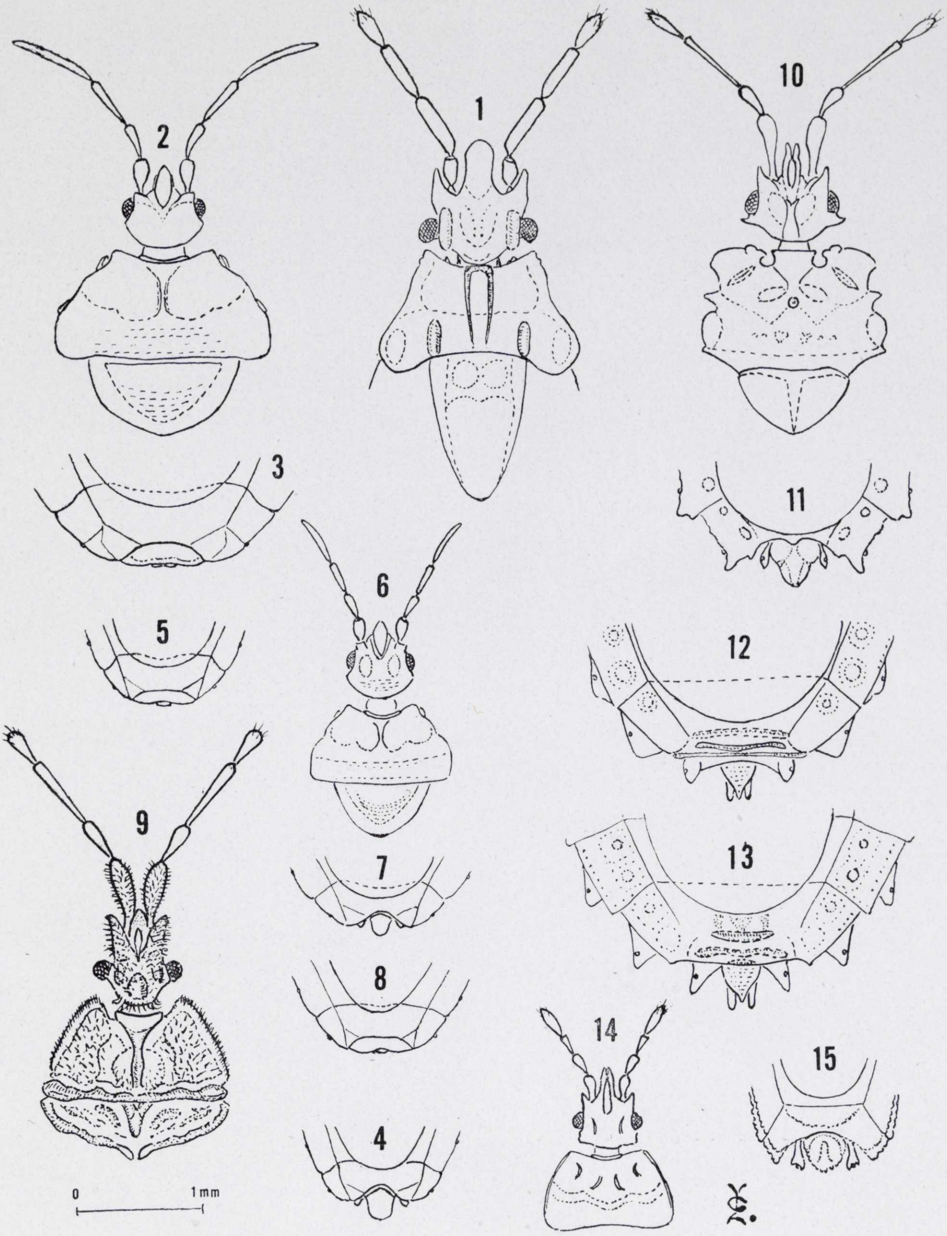
*Abdomen* ovate, much longer than its maximal width across segment V (♂-61: 34, ♀-59: 33). Connexivum moderately wide, slightly reflexed, with smooth lateral borders. PE-angles not protruding. Spiracles II lateral and visible from above, III to V ventral, placed near the border, VI to VIII lateral and visible from above. In the male: paratergites subtriangular, with rounded apex, reaching to the middle of widely ovate hypopygium, which is slightly shorter than its maximal width (7: 7.5). In the female: paratergites very short, rounded, barely visible from above; segment IX widely rounded, also barely visible from above.

Fore tibiae with a distinct comb on interior side near apex.

*Color:* head, pronotum, scutellum and hemelytra laterally, are dark brown to infuscate; abdomen, legs, and ventral side of the body, are yellow brown; rostrum yellow.

Total length: ♂-3.84, ♀-3.72 mm.; width of pronotum: ♂-1.04, ♀-1.08 mm.; width of abdomen: ♂-1.36, ♀-1.32 mm.

*Holotype:* ♂, New Hebrides, Banks I., Vanna Lava — L. E. Cheesman coll. VI.1929; Brit. Mus. 1930-8; deposited in the British Museum (N. H.), London.



Figs. 1-15.—1) *Aradus maroccanus* n. sp., ♂ ; head, pronotum and scutellum; 2) *Aneurus superbus* sp. nov., ♀, head, pronotum and scutellum; 3) Apex of abdomen of the same, dorsal aspect; 4) *Aneurus cheesmani* sp. nov., ♂, apex of abdomen dorsal aspect; 5) Apex of ♀ abdomen of the same, dorsal aspect; 6) *Aneurus papuasicus* sp. nov., ♂, head pronotum and scutellum; 7) Apex of abdomen of the same, dorsal aspect; 8) Apex of ♀ abdomen of the same, dorsal aspect; 9) *Zimmermania usingeri* sp. nov., ♀, head, pronotum and scutellum; 10) *Carventus elegantulus* sp. nov, ♂ ; head, pronotum and scutellum; 11) Apex of abdomen of the same, dorsal aspect; 12) *Carventus milleri* sp. nov., ♀, apex of abdomen, dorsal aspect; 13) *Carventus milleri borneensis* sp. nov., apex of abdomen, dorsal aspect; 14) *Ctenoneurus minutus* sp. nov., ♂, head pronotum; 15) Apex of abdomen of the same dorsal aspect.

*Allotype* ♀, and *paratypes* 2 ♀♀, collected with holotype; in the same collection, and collection of the author.

It is a pleasure to dedicate this species to Miss L. E. Cheesman, who has collected so many new species represented in this lot.

In Bergroth's key *A. cheesmani* n. sp. runs to *A. conviva* Bergroth, 1914, from which it may be separated by: ant. segment III is longer than II, IV is as long, or slightly longer than II and III together; scutellum is without levigate median line, and in the male, connexivum VI is not produced over base of connexivum VII.

### 4. **Aneurus papuasicus** sp. nov.

Figs. 6-8.

Male. Closely related to *A. cheesmani* n. sp., but slightly larger, postocular tubercles small, and blunt, but distinct; postocular borders almost straight; ant. segment III cylindrical, barely tapering toward the base. Abdomen relatively wider, and less narrowed anteriorly; hypopygium much smaller; in the female tergum VIII relatively narrower, ratio is 2.5: 11 (length: width), where as in *A. cheesmani* it is 2.4: 12.5; segment IX is more visible looking from above.

*Measurements:* head slightly shorter than width across eyes (♂-12: 12.5, ♀-12.5: 13); proportions of antennal segments, I to IV, are: ♂-4: 5.5: 7: 12, ♀-4: 5.5: 7: 12.5; pronotum less than half as long as its width (♂-13: 27.5, ♀-13: 29); scutellum subtriangular, ♂-10:17.5, ♀-12: 19; abdomen ovate longer than maximal width across segment V (♂-65: 38, ♀-67: 38; hypopygium shorter than maximal width 4.5: 5.

Spiracles II, VI to VIII, lateral and visible from above, III to V ventral, placed near the border.

*Color:* similar to *A. cheesmani* n. sp.

Total length: ♂-4.08, ♀-4.28 mm.; width of pronotum: ♂-1.10, ♀-1.16 mm.; width of abdomen: ♂-1.52, ♀-1.52 mm.

*Holotype:* ♂, New Guinea, Papua, Mafalu, 4000 ft. — L. E. Cheesman coll. I.1934; Brit. Mus. 1934-321; deposited in the British Museum (N. H.) London.

*Allotype* ♀, *paratypes* 4 ♂♂, collected with holotype; 3 ♂♂ & 3 ♀♀, Papua, Kokoda, 1200 ft. — L. E. Cheesman coll. IX.1933 in the same collection, and collection of the author.

## Subfam. **CARVENTINAE.**

### Gen. **Zimmermania** Usinger, 1948.

The first species described in this genus was micropterous, *Zimmermania brachyptera* Usinger, 1948, from Fiji; the second, macropterous, *Z. magdalenae* Kormilev, 1954, was from New Guinea. Usinger and Matsuda mentioned that they have seen two more: micropterous from New Hebrides, which is described here with, and macropterous from New Guinea (1959: 106).

### 1. **Zimmermania usingeri** sp. nov.

Fig. 9.

Male. Micropterous, ovate, heavily incrustated.

*Head* as long as width across eyes (♂-20: 20, ♀-21: 20). Anterior process greatly reduced, particularly clypeus, which barely reaches to the base of antennae, genae are a little longer, thin and subparallel. Antenniferous tubercles dentiform, strong, acute, subparallel, produced over the base of ant. segment I. Eyes moderately large, semiglobose, placed almost at 3/4 of the head's length. Postocular tubercles absent. Vertex raised medially, and with two (1 + 1) narrow and deep sulci mesad of eyes. Antennae strong, more than twice as long as head (♂-45.5: 20, ♀-51: 21); proportions of antennal segments, I to IV, are: ♂-13: 8: 15: 9.5, ♀-14: 10: 17: 10. Rostrum does not reach to hind border of a wide and deep rostral groove, which is closed posteriorly.

*Pronotum* less than half as long as its maximal width (♂-17.5: 40, ♀-19: 43). Collar distinct, sinuate anteriorly. Antero-lateral angles raised, rounded, and produced forward beyond collar; lateral borders strongly converging forward, provided with a double row of heavily incrustated bristles leaving between rows a long depression; hind border carinate, and slightly sinuate; disc deeply sulcate medially and raised laterally.

*Scutellum* less than half as long as its maximal width (♂-15: 32, ♀-15: 32.5). Lateral borders convex and carinate; apex rounded;

disc strongly raised medially, deeply depressed laterally; median ridge bifurcate anteriorly.

*Metanotum* split into two (1 + 1) narrow, transverse carinae, in the middle produced backward as short ridges.

*Hemelytra* reduced to small pads, placed laterad of scutellum.

*Abdomen* longer than maximal width across segment V (♂), or IV (♀), (♂-69: 56, ♀-73: 70), in the male with parallel sides, in the female ovate. Terga I and II fused with metanotum, but separated from central dorsal plate by a distinct transverse carina, flanked by sulci; their discs with a triple, median carina connected posteriorly with transverse carina. Central dorsal plate consists of terga III to VI fused together. Tergum III with a double, terga IV to VI with a single, carina medially. Median carinae of scutellum and abdomen with heavily incrustated, erect bristles. Limits between terga on central dorsal plate carinate, carinae bifurcate before reaching connexiva. Formula of round callous spots is 2: 2: 1. Tergum VII is strongly raised backward in the male, less so in the female. Connexivum wide, depressed exteriorly and raised interiorly; PE-angles progressively protruding from II to IV, becoming dentiform from V to VII; the latter angularly produced back and upward in the male, backward in the female. Spiracles II to VII ventral placed close to the margin, terminal on VIII. Paratergites short, subcylindrical in both sexes; hypopygium caudal in position, immersed in segment VII, disc raised medially and laterally. Segment IX in the female tricuspidate.

Fore tibiae with preapical spines; other legs unarmed.

*Color:* ferrugineous, shiny, but concealed by heavy, grey incrustation.

Total length: ♂-4.8, ♀-5.28 mm.; width of pronotum: ♂-1.60, ♀-1.72 mm.; width of abdomen: ♂-2.24, ♀-2.80 mm.

*Holotype:* ♂, New Hebrides, N. E. Malekula — L. E. Cheesman coll. VII.1929; Brit. Mus. 1929-514; deposited in the British Museum (N. H.), London.

*Allotype* ♀, and *paratypes:* 1 ♂ & 3 ♀ ♀, and 2 nymphs, collected with holotype, and in Malecula, Malua Bay — L. E. Cheesman coll. VII.1929; in the same Museum and collection of the author.

It is a pleasure to dedicate this species to Prof. Dr. Robert L. Usinger, who first identified it as a new species of *Zimmermania.*

### Gen. **Acanthaptera** Usinger and Matsuda, 1959.

1. **Acanthaptera ceylonensis** Usinger and Matsuda.

*Acanthaptera ceylonensis* Usinger and Matsuda, 1959, Class. Aradidae, p. 108.

1 ♂, Philippines — E. Simon coll.; Brit. Mus. 1903-91.
This specimen was mentioned by Usinger and Matsuda (1959: 110).

2. **Acanthaptera incrustata** Usinger and Matsuda.

*Acanthaptera incrustata* Usinger and Matsuda, 1959. Class Aradidae, p. 110.

1 ♀, Ceylon — Green coll.; Brit. Mus. 90-115.

### Gen. **Proxius** Stål, 1873.

This is a Neotropical genus, but one subgenus with one species is Oriental.

1. **Proxius (Nesoproxius) minutus** Usinger and Matsuda.

*Proxius (Nesoproxius) minutus* Usinger and Matsuda, 1959, Class. Aradidae; p. 114.

2 ♂ ♂ & 3 ♀ ♀, Malaysia, Pahang, F. M. S., Cameron Highlands, 4800 ft. — X.1923, ex F. M. S. Museum, Brit. Mus. 1955-354.

### Gen. **Carventus** Stål, 1865.

1. **Carventus schoutedeni** Hoberlandt.

*Carventus schoutedeni* Hoberlandt, 1954, Ann. Mus. Congo, Tervuren; in 4°, Zool. 1: 392.

1 ♀, Sierra Leone, Njala — E. Hargreaves coll.; Brit. Mus. 1948-48.

### 2. **Carventus elegantulus** sp. nov.

Figs. 10-11.

Male. Related to *Carventus longiventris* Kormilev (in press) from Philippines (Palawan), but the head is slightly longer than width across the eyes; tooth in the lateral notch of pronotum is stronger, reaching to outer border of hind lobe. PE-angles V and VI are angular, not rounded, and PE-VII produced backward as a narrow tooth (rectangular with blunt apex in *C. longiventris)*. The main difference is in position of spiracles: spiracles II are ventral, placed close to margin; III to VI are dorsal, progressively nearing to the border; VII lateral, and VIII dorso-lateral, and visible from above.

*Measurments:* head — 21: 19.5 across eyes, and 22.5 across postocular tubercles; proportions of antennal segments, I to IV, are: 11: 7: 15: 9.5; pronotum shorter than maximal width across fore lobe (25: 33), or hind lobe (25: 38); scutellum subtriangular — 14: 23; abdomen 64: 51.

*Color:* pale yellow brown, almost ochraceous; head, first two antennal segments, and ventral side of the body, are darker; ant. segments III anf IV reddish brown.

Total length — 5.0 mm.; width of pronotum — 1.52 mm.; width of abdomen — 2.04 mm.

*Holotype:* ♂, New Guinea, Papua, Kokoda, 1200 ft. — L. E. Cheesman coll. V.1933; Brit. Mus. 1933-427; deposited in the British Museum (N. H.) London.

### 3. **Carventus milleri** sp. nov.

Fig. 12.

Female. Elongate ovate, partially covered with white incrustation.

*Head* longer than width across eyes (26: 23). Anterior process bifide, reaches to 2/5 of antennal segment I. Antenniferous tubercles slender, acute, subparallel, reach to 1/4 of ant. segment I Eyes large, semiglobose. Postocular tubercles small, slightly do not reach to outer border of eyes. Postocular borders sinuate. Vertex granulate. Upper surface of the head incrustate with exception of clypeus and two (1 + 1) ovate spots mesad of eyes. Antennae long and slender, more than twice as long as head (53: 24); proportions, I to IV, are: 18: 12: 14: 9.

Rostrum does not reach to hind border of rostral groove, which is closed posteriorly.

*Pronotum* shorter than its maximal width (35 : 50). Collar large, raised and dilated anteriorly. Fore lobe separated in the middle from hind lobe by a fine, but deep sulcus; anterior angles produced forward as short, stout teeth, touching the collar; antero-lateral angles dentiform, obliquely produced forward; lateral borders behind them parallel. Fore disc with two (1 + 1) small, transverse carinae just behind collar; in the middle with a median sulcus, and laterad of it with four (2 + 2) small callosities; lateral borders inflated, and granulate; among granules are placed a few small callous spots. Hind lobe with two (1 + 1) strong teeth placed just behind lateral notch; hind disc inflated laterally and granulate. In the middle of hind disc anteriorly are placed two (1 + 1) large, smooth streaks without incrustation; and along hind border run two rows of granules. Hind border convex in the middle, and angularly produced laterally.

*Scutellum* subtriangular, shorter than width at the base (14 : 25); lateral borders slightly convex, and stoutly carinate; apex depressed, form a right angle. Disc raised along basal border; a row of granules forms a median ridge.

*Hemelytra* reach to 2/3 of tergum VII; corium does not reach to the middle of scutellum, its baso-lateral border reflexed. Membrane large, with a few oblique folds.

*Abdomen* ovate, longer than maximal width across segment IV (94 : 70). Connexivum wide, and partly incrustate; connexiva II and III fused together, other separated from each other. PE-angles not protruding, but there is an exoconnexivum which is narrow and straight on segments II to IV, and progressively angularly protruding on V to VII, with the tip slightly displaced backward from the middle; the tip of VII is produced as far as posterior border of tergum VII. Paratergites dentiform, reaching to the middle of a large, tricuspidate segment IX. Spiracles ventral on II, sublateral, but not visible from above on III to IV, dorso-lateral and visible on V to VIII.

*Legs* unarmed.

*Color:* reddish brown, but mostly covered by white-grayish incrustation.

Total length — 6.8 mm.; width of pronotum — 2.0 mm.; width of abdomen — 2.8 mm.

*Holotype:* ♀, Indonesia, Sumatra, Fort de Kock, 920 m. — E. Jacobson coll. 1925; with a label: "*Carventus* sp. det. N. C. E. Miller, 1954". Deposited in the Bristish Museum (N. H.), London.

It is a pleasure to dedicate this species to Mr. N. C. E. Miller, British Entomologist, who first recognized and published that apterous Aradids are not nymphs, but adult specimens.

### A. **Carventus milleri borneensis** sp. nov.

Fig. 13.

Female. Similar to *C. milleri* n. sp., but more robust; postocular tubercles smaller, by far do not reach to outer border of eyes; exoconnexivum much more developed, distinctly serrate on segments II to IV, and more angularly produced on V to VII; the latter produced beyond hind border of tergum VII. Paratergites dentiform, narrower and longer than in *C. milleri* n. sp. Position of spiracles as in *C. milleri* n. sp.

*Measurements:* head — 29: 25; proportions of antennal segments, I to IV, are: 19: 10.5: —: — (two apical are missing). Pronotum — 35: 51; scutellum — 15: 22.5; abdomen — 93: 75 (across segment V).

*Color:* reddish brown to brown, but mostly covered by white incrustation.

Total length — 7.0 mm.; width of pronotum — 2.04 mm.; width of abdomen — 3.0 mm.

*Holotype:* ♀, Borneo, Sarawak — H. Shelford coll. 1897; deposited in the British Museum (N. H.), London.

*Carventus milleri* n. sp., and *Carventus milleri borneensis* n. ssp. belong also to the group previousely considered as *Camerarius* Distant, 1902, later synonymized by Usinger and Matsuda with *Carventus* Stål, (1959: 120). They are somewhat related with *Carventus wappersi* (Kormilev), 1954, but abdomen is more ovate, exoconnexivum angularly protruding, and paratergites are shorter, do not reach to the tip of segment IX in the female.

## Subfam. **MEZIRINAE.**

### Gen. **Chelonocoris** Miller, 1938.

This curious genus is exclusively Oriental, distribuited in Malasia and Indonesia.

### 1. **Chelonocoris dyak** Miller.

*Chelonocoris dyak* Miller, 1938, Ann. Mag. Nat. Hist.; (11) **1**: 508.

2 ♀ ♀, Borneo, Kuching — J. M. Bryan coll.; Brit. Mus. 1931-150.

## Gen. **Ctenoneurus** Bergroth, 1887.

### 1. **Ctenoneurus minutus** sp. nov.

Figs. 14-15.

Male. Elongate, with parallel sides, finely granulate.

*Head* as long as width across eyes (16: 16). Anterior process long, conical, produced beyond the tip of antennal segment I; genae narrow, contiguous in front of clypeus. Antenniferous tubercles short, blunt, with parallel outer borders. Eyes large, protruding. Postocular borders almost rectangular. Vertex slightly convex, evenly finely punctured, and with two (1 + 1) curved, narrow, shiny streaks mesad of eyes. Antennae less than 1 1/2 times as long as head (22.5: 16); proportions of antennal segments, I to IV, are: 5: 5: 4.5: 8. Rostrum reaches over basal border of prosternum.

*Pronotum* almost half as long as its maximal width (15: 28), densely and evenly granulate. Collar very thin, slightly sinuate anteriorly; anterior borders transversely truncate; antero-lateral angles angularly rounded, neither produced forward, nor sideways; lateral borders evenly convex; lateral notch absent. Hind border slightly and widely sinuate. Interlobal depression distinct. Fore disc slightly convex, placed at the same level as hind disc; with four (2 + 2) crescent— shaped, narrow, shiny spots: two outer ones placed near front border, and two inner onces near hind border. Hind disc evenly granulate.

*Scutellum* shorter than width at the base (14.5: 23), densely granulate; lateral borders carinate, and sinuate before apex; the latter rounded; median ridge absent.

*Hemelytra* reach to hind border of tergum VI; baso-lateral borders of corium straight, making an obtuse angle with post-lateral, which are also straight; apical angle rounded; apical border convex exteriorly and sinuate interiorly. Membrane with anastomosed veins.

*Abdomen* longer than maximal width across segment IV (51: 30);

lateral borders subparallel, raised, slightly widening from II to IV, then converging. Connexiva II and III fused together on dorsal side, semifused on ventral; discs of connexiva scabrous; exterior borders of connexiva VI and VII with a double row of granules (one upper, and one lower row). PE-angles not protruding; PE-VII produced as an acute angle. Paratergites large, flat, obliquely truncate. Hypopygium rounded posteriorly, depressed near the base, densely and roughly granulate on posterior half. Spiracles II to VII ventral, and not visible from above; VIII terminal.

Metapleura obliquely, densely striate.

*Color:* ferrugineous, partially darker; base of ant. segment III, rostrum, tarsi, and clavus, are lighter; base of membrane whitish.

Total length 3.9 mm.; width of pronotum 1.12 mm.; width of abdomen 1.20 mm.

*Holotype:* ♂, New Hebrides, Malekula — L. E. Cheesman coll. IV.1930; Brit. Mus. 1930-393; deposited in the British Museum (N. H.), London.

*Ctenoneurus minutus* n. sp. is the smallest of all known species in this genus; it is related to *C. bergrothi* Kirkaldy, 1908, from Fiji, but much smaller; vertex is finely punctured, not granulate; tergum VII and hypopygium are differently shaped, and membrane with distinctly anastomosed veins.

## Gen. **Neuroctenus** Fieber, 1861.

### 1. **Neuroctenus nitidulus** Bergroth.

*Neuroctenus nitidulus* Bergroth, 1887, Öfv. Fin. Vet. Förh.; **29**: 177.

2 ♀♀, New Guinea, Papua, Kokoda, 1200 ft. — L. E. Cheesman coll. VIII.1933; Brit. Mus. 1933-427.

## Gen. **Pictinellus** Usinger and Matsuda, 1959.

### 1. **Pictinellus sundanus** Blöte.

*Pictinellus sundanus* Blöte, 1965, Zool. Verh.; **75**: 22.

1 ♀, Indonesia, Sumatra, Fort de Kock, 920 m. — E. Jacobson coll. 1924; 1 ♀, Borneo, Sarawak, Mt. Matang — G. E. Bryant coll. XII.1913 — I.1914; G. Bryant collection 1919-147 (Brit. Mus.).

### 2. **Pictinellus longiceps** Kormilev (in press).

1 ♂, New Guinea, Papua, Kokoda — L. E. Cheesman coll. IX.1933; Brit. Mus. 1934-321.

### 3. **Pictinellus moturikiensis** Kormilev (in press).

1 ♀, New Hebrides, Malekula, Ounua — L. E. Cheesman coll. IV-V.1929, Brit. Mus. 1929-371; 1 ♀ New Hebrides, Malekula — L. E. Cheesman coll. I.1930; Brit. Mus. 1930-178.

## Gen. **Chiastoplonia** China, 1930.

### 1. **Chiastoplonia pusilla** sp. nov.

Fig. 16.

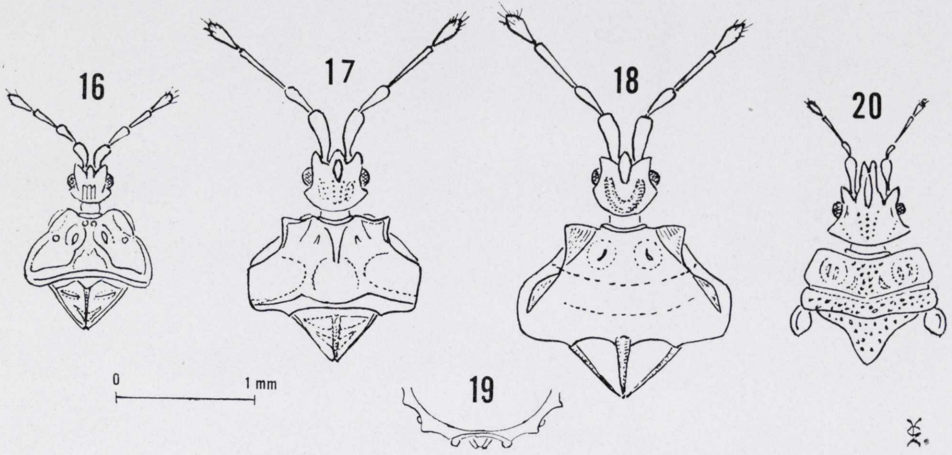
Female. Somewhat related to *Ch. minuta* Kormilev, 1965, from Australia, but smaller; antennae relatively shorter, 1 1/2 times as long as head, particularly ant. segment III is much shorter, as long as IV; median carina on the vertex is higher, and simple, not "V"— form. On the pronotum, just behind collar, are placed two (1 + 1) small, round tubercles, and behind them median sulcus. Lateral borders of fore lobe lower, only slightly, angularly raised; interlobal notch forms a very obtuse angle; central portion of hind disc is slightly raised, limited by an pentagonal depression. Transverse carina of hind lobe is lower, and runs very close to hind border on the whole length. Connexivum is concolor; PE-angles not protruding. Spiracles VII not visible from above. Corium with two raised veins, and smooth disc (only one raised vein in *Ch. minuta,* and disc transversely rugose).

*Measurments:* head — 7: 10; proportions of antennal segments, I to IV, are: 5: 4: 5.5: 5.5; pronotum 10: 23.5; scutellum 10: 19; abdomen 32: 26.

Spiracles II and III lateral and visible from above, IV to VII ventral, VIII terminal.

*Color:* uniformely testaceous; lateral borders of pronotum, and carina of scutellum, are darker.

Total length — 2.64 mm.; width of pronotum — 0.94 mm.; width of abdomen — 1.04 mm.



Figs. 16-20.—16) *Chiastoplonia* pusilla n. sp., ♀, head, pronotum and scutellum; 17) *Chiastoplonia antennata* n. sp., ♂, head, pronotum and scutellum; 18) *Aphelocoris carinatus* n. sp., head, pronotum and scutellum; 19) Apex of abdomen of the same, dorsal aspect; 20) *Micromezira australis* n. g., n. sp, ♂, head, pronotum, scutellum and hemelytra.

*Holotype:* ♀, Ceylon — Thwaites coll., 1867; deposited in the British Museum (N. H.).

### 2. **Chiastoplonia antennata** sp. nov.

Fig. 17.

Male. Elongate ovate, with subparallel sides.

Closely related to *Ch. ovata* Kormilev, 1954, from New Guinea, but larger; antennae relatively longer, more than three times as long as the head; antennal segment III relatively shorter, less than twice as long as II, or IV; triangular process on lateral borders of the fore lobe of pronotum is forming an acute angle, slightly inclined backward (forms a right angle in *Ch. ovata* Kormilev); scutellum relatively shorter, and abdomen relatively longer, 4 1/2 times as long as the head (less than 4 times in *Ch. ovata* Kormilev).

Spiracles II and III dorso-lateral and visible from above; III to VII ventral, placed close to the border, and slightly visible from above; VIII terminal.

Other characters as in *Ch. ovata* Kormilev.

*Measurements:* head shorter than width across the eyes (10: 12.5); proportions of antennal segments, I to IV, are: 8 : 7 : 12 : 6.5; pronotum shorter than width across humeri (16: 32); scutellum shorter than width at the base (10: 15); abdomen longer than maximal width (45: 34); hypopygium small, caudal in position and strongly declivous, longer than its maximal width (6: 5); paratergites small, cylindrical, produced as far as hypopygium.

Color: ferrugineous; scutellum darker, with median carina piceous; rostrum and tarsi yellow.

Total length — 3.40 mm.; width of pronotum — 1.28 mm.; width of abdomen — 1.36 mm.

*Holotype:* ♂, Indonesia, Sumatra, Gunung Singgalang, 1800 m. — E. Jacobson coll., 1925; deposited in the British Museum (N. H.), London.

### Gen. **Aphelocoris** Usinger and Matsuda, 1959.

### 1. **Aphelocoris simplex** Blöte.

*Aphelocoris simplex* Blöte, 1965, Zool. Verh.; **75**: 24.

2 ♀ ♀, Indonesia, Sumatra, Fort de Kock — 920 m. — E. Jacobson coll. 1924 & 1925.

### 2. **Aphelocoris carinatus** sp. nov.

Figs. 18-19.

Female. Robust, narrowing from humeri backward.

*Head* shorter than width across eyes (12: 14). Anterior process short, blunt, reaches to 1/4 of ant. segment I. Antenniferous tubercles short, robust, but acute apically. Eyes moderately large, protruding. Postocular borders slightly convex, rounded. Vertex with "V"—shaped depression medially, and two (1 + 1) curved, finely granulate ridges lateral of the latter. Antennae robust, less than three times as long as head (33: 12); proportions, I to IV, are: 8 : 7 : 10 : 8. Rostrum reaches to hind border of a shallow rostral groove, which is open posteriorly.

*Pronotum* less than half as long as its maximal width (18 : 39). Collar truncate anteriorly, and indistinctly separated from the disc. Antero-lateral angles strongly reflexed into two (1 + 1) vertical, blunt, laterally flattened projections. Lateral borders straight, and slightly receeding backward of humeri, strongly convergent and slightly sinuate anteriorly. Hind border transverse at postero-lateral angles, convex in the middle. Fore disc rugose, strongly depressed in the middle, depression flanked by two (1 + 1) crescent-shaped callosities. Hind disc convex transversely rugose, and irregularly covered with a round, shiny granulation. Along humeri are placed two (1 + 1) high ridges, slightly inclined inward.

*Scutellum* triangular, half as long as its width at the base (10: 21); lateral borders straight, apex acute; disc raised and roughly scabrous, covered with irregular pits and ridges; median carina thin, tapering backward.

*Hemelytra* reach almost to hind border of tergum VII. Corium short and obliquely truncate posteriorly; its inner angle does not reach to the tip of scutellum; its outer angle almost reaches to protruding spiracle II. Membrane large, without veins.

*Abdomen* ovate longer than its maximal width across segment II, regularly tapering backward. Connexivum narrow; PE-angles from II to VII produced into vertical tubercles, progressively becoming longer from II to IV, then diminishing to VII. Spiracles II lateral, placed on a tubercle, and visible from above; III to VII ventral, placed far from border; VIII terminal. Genital segments caudal in position; paratergites short, vertical; valves slightly projecting backward.

*Legs* unarmed.

*Color:* dark brown to ferrugineous; rostrum, tibiae and tarsi, are light ferrugineous.

Total length — 3.72 mm.; width of pronotum — 1.56 mm.; width of abdomen — 1.48 mm.

*Holotype:* ♀, Indonesia, Sumatra, Gunung Singgalang, 1800 m. — E. Jacobson coll. 1925; deposited in the British Museum (N. H.), London.

*Aphelocoris carinatus* n. sp. is related to *A. simplex* Blöte, 1965, but is more robust, antero-lateral angles of pronotum vertically raised; two (1 + 1) high carinae run along humeri.

## Gen. **Glochocoris** Usinger and Matsuda, 1959.

### 1. **Glochocoris longiventris** sp. nov.

Female. Closely related to *G. biroi* Kormilev, 1960, from New Guinea, but narrower; antennae relatively longer and more slender; all depressions on pronotum less pronounced; lateral borders and median carina of scutellum thinner and lower; abdomen relatively longer; exterior border of connexivum VII convex (sinuate in *G. biroi*). Spiracles II to VII ventral and not visible from above, VIII lateral.

Comparative measurements:

| | ♀, *G. biroi* Korm. | ♀, *G. longiventris* n. sp. |
|---|---|---|
| Head | 10.5 : 11 | 11 : 10.5 |
| Antennae | 5.5 : 6 : 5.5 | 5.5 : 4 : 7 : 5 |
| Pronotum | 15 : 25 | 13.5 : 23 |
| Scutellum | 10 : 14 | 11 : 12.5 |
| Abdomen | 37 : 28 | 43 : 27 |
| Total length | 3.00 mm. | 3.24 mm. |
| Width of pronotum | 1.00 mm. | 0.92 mm. |
| Width of abdomen | 1.12 mm. | 1.08 mm. |

Measurements for *G. biroi* were taken from a paratype.

*Color:* pale ferrugineous.

*Holotype:* ♀, New Guinea, Papua, Kokoda, 1200 ft. — L. E. Cheesman coll. IX.1933; Brit. Mus. 1934-321; deposited in the British Museum, (N H.), London.

### 2. **Glochocoris similis** sp. nov.

Male. Closely related to *G. longiventris* n. sp. but relatively shorter. Antennal segment I as long as III. Lateral borders of pronotum distinctly sinuate in the middle (barely sinuate in *G. longiventris*). Abdomen relatively shorter; exterior border of connexivum VII slightly sinuate, and spiracle VII is slightly visible from above. Other characters, inclusively color, are the same as in *G. longiventris* n. sp.

*Measurements:* head — 11 : 10; proportions of antennal segments, I to IV, are: 5.5 : 3.5 : 5.5 : 5; pronotum — 13.5 : 23; scutellum — 11 : 12.5; abdomen — 36 : 26.

Total length — 2.92 mm.; width of pronotum — 0.92 mm.; width of abdomen — 1.04 mm.

*Holotype:* ♂, New Guinea, Papua, Mafulu, 4000 ft. — L. E. Cheesman coll. I.1934; Brit. Mus. 1934-321; deposited in the British Museum (N. H.), London.

## **Micromezira** gen. nov.

Elongate ovate, covered with rough, round, shiny and dense granulation, but without hairs, with exception of apical half of ant. segment IV, which has a few bristles.

*Head* as long as width across eyes. Anterior process with subparallel sides, apex rounded and incised in the middle, does not reach to apex of ant. segment I; genae longer than clypeus and contiguous in front of it. Antenniferous tubercles dentiform, strong, divaricating. Eyes small, semiglobose, protruding. Postocular tubercles dentiform, produced beyond outer border of eyes. Vertex with a triple, longitudinal row of small tubercles, and with two (1 + 1) small calosities laterad of them. Infraocular carinae absent. Antennae slender, 1 1/2 times as long as head. Ant. segment I clavate, II tapering toward the base, III subcylindrical, petiolate at base, IV fusiform; II the shortest, IV the longest, I and III subequal in length. Rostrum reaches to hind border of rostral groove; rostral atrium is closed.

*Pronotum* trapezoidal, half as long as its maximal width. Collar distinctly separated from the disc by a deep sulcus; anterior borders trasversely truncate; antero-lateral angles rounded, neither produced forward, nor sideways; lateral borders straight, divergent backward; lateral notch minute; hind border evenly convex. Fore disc separated from hind disc by a deep and narrow depression; just behind collar is placed a group of rough granules in the shape of an inverted triangle; laterad of it are placed four (2 + 2) small, crescent-shaped callosities, and along lateral borders run two (1 + 1) curved rows of small granules. Hind disc roughly granulate.

*Scutellum* triangular, half as long as its width at the base; lateral borders sinuate, apex rounded; disc convex and densely and roughly granulate.

*Hemelytra* reduced to small, granulate pads, reaching to the middle of scutellum.

*Metanotum* subtriangularly, deeply depressed anteriorly; raised and densely granulate posteriorly and laterally; metanotum is separated from tergum I and connexivum II by a deep sulcus.

*Abdomen* longer than maximal width; lateral borders parallel from segments II to IV, then convergent. Terga I and II fused together, and separated from central dorsal plate, which consists of terga III to VI completely fused together, by a fine sulcus. The whole dorsal surface of abdomen is densely and roughly granulate. Formula of round, callous spots is: 2 : 1 : 1. From tergum III to tergum VI is placed a rhomboid, transversely, finely rugose spot, on which are discernible scares of dorsal scent glands, placed between terga III and IV, and IV and V respectively. Tergum VII is raised for reception of a large hypopygium (♂). Connexivum is wide, densely granulate. Connexiva II and III fused together, on dorsal and ventral sides; other separated from each other. PE-angles not protruding on II to IV, slightly protruding, rounded on V and VI, VII produced backward as a right angle with a rounded tip. Paratergites and hypopygium are missing in this specimen.

*Sternum* and pleurae densely granulate. Metathoracic gland openings placed laterally near the border, just below wing pads.

*Venter* convex; hind borders of sterna III to V straight, raised, and finely carinate; that of IV and VII are simple; discs scabrous, and with rough granulation laterally.

*Legs* unarmed; trochanters semifused with femora; the latter fusiform; tibiae cylindrical; aroliae present.

*Type species: Micromezira australis* sp. nov.

*Micromezira* n. g. is related to *Mezira* A. S., 1843, but is smaller, terga I and II are fused together, as also connexivum II and III; midlateral glabrous areas are fused with central dorsal plate. Rough, round, dense, and shiny granulation is completely void of hairs or bristles.

### 1. **Micromezira australis** sp. nov.

Fig. 20.

Male. Testaceous, partially darker; scares of dorsal scent glands and surrounding them rhomboidal spot, are dark ferrugineous; PE-angles yellow.

*Measurements:* head — 14: 14, proportions of antennal segments, I to IV, are: 5:4:5.5:7; pronotum — 13:26; scutellum — 9:19; abdomen — 42:31 across segment V.

Total length — 3.14 mm.; width of pronotum — 1.04 mm.; width of abdomen — 1.24 mm.

*Holotype:* ♂, Australia, N. S. W., Sydney — J. J. Walker coll. 1900-03; Brit. Mus. 1910-384; deposited in the British Museum (N. H.), London.

## References.

Amyot, C. J. B., and Serville, J. G. A.
1843. Histoire Naturelle des Insects, Paris. *Hemiptères:* 303-309.

Bergroth, E.
1914. Zur Kenntnis der Gattung *Aneurus* Curt. (Hem., Aradidae); *Ann. Mus. Nat. Hung.;* **12**: 89-108.

Distant, W. L.
1902. Rhynchotal notes; *Ann. Mag. Nat. Hist.;* (7) **9**: 358-362.

Horváth, G.
1911. Hemiptera nova vel minus cognita e regione Palaearcticae II; *Ann. Mus. Nat. Hung.;* **9**: 584-587.

Kiritshenko, A. N.
1913. Dysodiidae et Aradidae (in Russian with latin descriptions); Faune de la Russie, *Ins. Hem.;* **6**: ii + 301 pp. 2 pl.

Kirkaldy, G. W.
1908. A Catalogue of the Hemiptera of Fiji; *Proc. Linn. Soc. N. S. W.;* **33**: 350-352.

Kormilev, N. A.
1954. Notes on Aradidae from the Eastern Hemisphere (Hemiptera) II; *The Philipp. Jour. Sc.;* **83**: 123-136, 5 figs.

1960. Notes on Aradidae from the Eastern Hemisphere XVII (Hemiptera); *Quart. Jour. Taiwan Mus.;* **13**: 163-174, 2 figs.

1965. Notes on Australian Aradidae (Hemip.: Heter.), with descriptions of New Genera and Species; *Proc. R. Soc. Queensland;* **77**: 11-35, 11 figs.

USINGER, R. L.

1948. A new genus and species of Aradidae from Fiji (Hemiptera); *Proc. Hawaii Ent. Soc.;* **13**: 261-264, 2 figs.

USINGER, R. L., and MATSUDA, R.

1959. Classification of the Aradidae, Brit. Muss, London vii + 410 pp., 101 figs.